

Collaborative Investigation at a Biosolids Land Application Test Site

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Team Partners

USEPA/ORD/NRMRL/LRPCD and APPCD; USEPA/OW/OWM and OST; USEPA/ORD/NHEERL; USEPA Region 5; USDA; NCDA&CS (Piedmont Research Station); Battelle; NC State University; PADEP; NCDENR; University of Arizona; University of Colorado at Boulder; NEBRA; ISG (citizen group)

Background

Recent estimates indicate that each year municipal wastewater treatment plants in the United States produce about 11 million dry metric tons of processed sludge (biosolids), and their ultimate use or disposal continues to be a challenge. Since ocean dumping was banned in 1992, the remaining options include landfilling, incineration, or land application. With landfill capacity decreasing and incineration unpopular, beneficial reuse by land application has increased to account for about 60 percent of biosolids produced yearly. The number of health-related complaints from residents living near biosolids land application sites has continued to increase. Many of these complaints occur during or just after application. USEPA asked the National Research Council (NRC) to provide an independent technical review of the existing biosolids regulations (40 CFR Part 503) and the development of the chemical and pathogen standards as they pertain to human health. That report was issued in 2002 and made several recommendations for future activities. This study was conducted in September 2004 at the Piedmont Research Station in Salisbury, North Carolina to begin addressing some of the NRC recommendations. A 2-acre plot (100-meter diameter circle) of pasture grass was the primary area of investigation. This site was selected in part because no biosolids had been applied previously. Air and soil sampling was conducted prior to and during the surface application of anaerobically digested and dewatered biosolids. Soil sampling continued for several months following application.

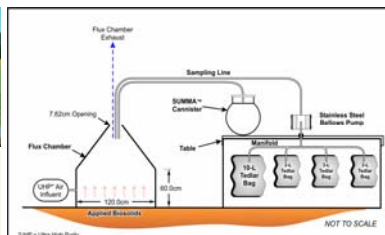
Goal

Compare air and soil sampling methods and optimize them, if necessary, in order to develop a protocol that can be used in future studies to obtain data on the release of airborne and soil-bound contaminants during the application of biosolids on land.

Volatile Organic and Inorganic Compound and Odor Analysis

Measurements

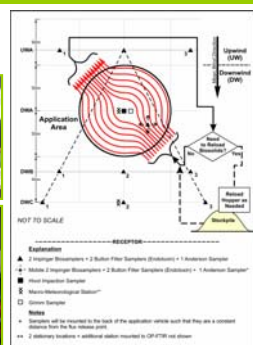
- Headspace Analysis
 - SVOC Analysis
 - OP-FTIR
 - Field Olfactometry (Nasal Ranger)
 - Flux Chamber
- Sampling
- Summa Canister
 - Olfactometry
 - SPME



Bioaerosol and Particulate Sampling

Measurements

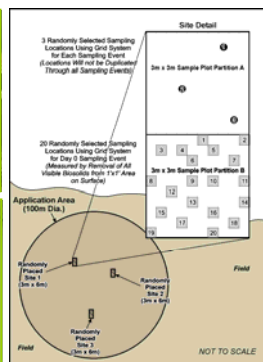
- Biosampler
- Button Sampler
- Anderson 6-Stage Sampler
- High Volume Impaction Sampler
- GRIMM Dust Monitor



Land Sampling

Analyses

- FAME
- Bacteria and Viruses
- Selected Microbial Indicators
- Nonylphenol and Octylphenol
- Ecotoxicity
- Agronomic Soil Characterization
- Dry Mass Volatile Solids



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